

CLAIMS

The embodiments of an invention in which an exclusive property or right is claimed are defined as follows:

1. An optical sensing system for detecting target motion within a known environment, which comprises:

a vertical cavity surface emitting laser source with at least two laser signal emission apertures;

at least one detector operationally responsive to laser signals;

a microprocessor operationally coupled to said at least one detector; and

a motion analysis module for determining motion characteristics of an object detected within said environment.

wherein said laser source emits at least two laser signals into an environment occupied by a target, said at least one detector detects changes in said at least two laser signals after said signals pass through said environment and interfere with a detected object, and said microprocessor determines target characteristics based on said signals received by said detector and input from said motion analysis module.

2. The system of claim 1, wherein said laser source emits at least said two laser signals statically.

3. The system of claim 1, wherein said laser source emits at least one laser

signal at a time serially.

4. The system of claim 1, wherein said detector is a photodiode.

5. An optical sensing system for detecting target motion within a known environment, which comprises:

a laser with at least two laser signal emission apertures;
at least one detector operationally responsive to said laser source;
a microprocessor operationally coupled to said at least one detector;
a memory for storing characteristics of a monitored environment; and
a motion analysis module for determining motion characteristics of an object detected within said environment.

wherein said laser source emits at least two laser signals into an environment occupied by a target, said at least one detector detects changes in said at least two laser signals after said signals pass through said environment and interfere with a detected object, and said microprocessor determines target characteristics based on said signals received by said detector, reference to said memory and input from said motion analysis module.

6. The system of claim 5, wherein said laser source is a vertical cavity surface emitting laser.

7. The system of claim 5, wherein said laser source emits at least said two laser signals statically.

8. The system of claim 5, wherein said laser source emits at least one laser signal at a time serially.

9. The system of claim 5, wherein said detector is a photodiode.

10. A method for detecting the motion of an object detected within an monitored environment, including the steps of:

emitting at least two laser signals into a monitored environment vertical cavity surface emitting laser structure statically;

at least one target blocking at least one of said laser signals;

at least one detector transmissively receiving any of said laser signals not blocked by said target; and

a microprocessor determining target motion by comparing characteristics of said laser signals emitted by said vertical cavity surface emitting laser structure with characteristics of said laser signals received by said detector.

11. The method of claim 10, wherein said microprocessor determines the size or shape of said target by determining which said laser signals are received by said detector after different arrays of said laser signals are emitted by said vertical

cavity surface emitting laser structure.

12. The method of claim 10, wherein said microprocessor determines the presence or absence of a specific said target by comparing the array of said laser signals emitted by said vertical cavity surface emitting laser structure with the array of said laser signals received by said detector.

13. The method of claim 10, wherein said microprocessor detects motion of said target by detecting changes in the array of said laser signals that are blocked by said target.

14. The method of claim 10, wherein said microprocessor detects motion of a specific said target by detecting changes in a specific array of said laser signals that are blocked by said specific target.